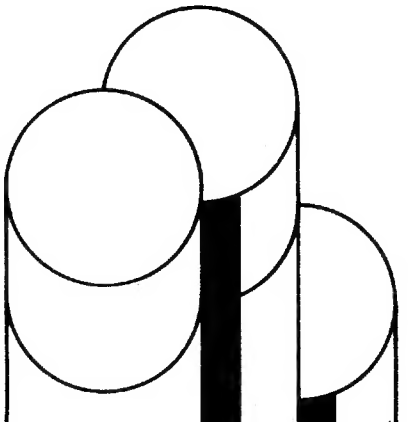
Reference Summary

IBM 3380 Direct Access Storage

GX26-1678-0

IBM



3380 Device Characteristics

Physical Characteristics		
Head and Disk Assemblies per Unit	2	
Access Mechanisms per Head and Disk Assembly	2	
Heads per Access Mechanism	15	data
	1	and servo
Cylinders per Access Mechanism		
Data	885	
Alternate	1	
Customer Engineer	1	
Data Tracks per Cylinder	15	
Tracks per Access Mechanism		
Data	13,275	
Alternates	15	
Maximum Data Capacity		
per Track	47,476	bytes
per Cylinder	712,140	bytes
per Access Mechanism	630.2	MB
per Head and Disk Assembly	1.26	GB
per Unit	2.52	GB
per String	10.08	GB

Performance Characteristics		
Seek Time [1]		
Minimum	3.0	ms
Average	16.0	ms
Maximum	30.0	ms
Rotational Delay Time [2]	8.3	ms
Data Rate [3]	3.0	MB/sec

Notes:

1. **Seek time, or access motion time,** *is the time required to position the access mechanism at the track (cylinder). The average seek time is for one third of the cylinders. If the mechanism is already at the correct track (cylinder), there is no access motion and seek time is zero.*
2. **Rotational delay time, or rotational latency time,** *is the average time required for the specified record to rotate to the read and write head so that the data transfer can begin. It is one-half the disk rotation time.*
3. **Data rate** *is the instantaneous speed at which bytes are transferred.*

Space Calculation Formula

Space calculations are determined for physical records.

All data on a 3380 is written in 32-byte increments.

The number of equal length physical records per track can be calculated as follows. Track overhead for the home address, track descriptor record (R0), and skip defect allowance has already been accounted for.

$$\text{Equal length records per track} = \frac{1499}{C + K + D}$$

1499 is the number of 32-byte increments per track available for user data records.

C is the number of 32-byte increments used by the record overhead including gaps and the count area.

K is the number of 32-byte increments used by the key area.

D is the number of 32-byte increments used by the data area.

KL is the key length in bytes.

DL is the data length in bytes.

where $C = 15$ if $KL = 0$

$C = 22$ if $KL \neq 0$

$K = 0$ if $KL = 0$

$$K\dagger = \frac{KL + 12}{32} \text{ if } KL \neq 0$$

$$D\dagger = \frac{DL + 12}{32}$$

† These values are rounded up to the next integer. KL and DL each must have 12 added and each must be rounded up to a multiple of 32.

Space Calculation Tables

The following tables give the number of equal length records of given byte sizes that can be placed on a track and cylinder. Also given are the total number of bytes used on the track and cylinder for the particular number of records.

One table gives the calculations for records without keys. The size of the record is the data length (DL). The other table gives the calculations for records with keys. The size of the record is the data length (DL) + the key length (KL). DL and KL are both rounded up to multiples of 32 – 12.

For example, for records without keys, data lengths from 7,477 to 9,076 bytes allow 5 records per track and 75 records per cylinder. Five records of 9,076 bytes use a total of 45,380 bytes of the capacity of a track.

Equal Length Physical Records Without Keys

DL Bytes (Max)	Track Capacity		Cylinder Capacity	
	Records	Bytes	Records	Bytes
47,476	1	47,476	15	712,140
23,476	2	46,952	30	704,280
15,476	3	46,428	45	696,420
11,476	4	45,904	60	688,560
9,076	5	45,380	75	680,700
7,476	6	44,856	90	672,840
6,356	7	44,492	105	667,380
5,492	8	43,936	120	659,040
4,820	9	43,380	135	650,700
4,276	10	42,760	150	641,400
3,860	11	42,460	165	636,900
3,476	12	41,712	180	625,680
3,188	13	41,444	195	621,660
2,932	14	41,048	210	615,720
2,676	15	40,140	225	602,100
2,484	16	39,744	240	596,160
2,324	17	39,508	255	592,620
2,164	18	38,952	270	584,280
2,004	19	38,076	285	571,140
1,876	20	37,520	300	562,800
1,780	21	37,380	315	560,700
1,684	22	37,048	330	555,720
1,588	23	36,524	345	547,860
1,492	24	35,808	360	537,120
1,396	25	34,900	375	523,500
1,332	26	34,632	390	519,480
1,268	27	34,236	405	513,540
1,204	28	33,712	420	505,680
1,140	29	33,060	435	495,900
1,076	30	32,280	450	484,200
1,044	31	32,364	465	485,460
980	32	31,360	480	470,400
948	33	31,284	495	469,260
916	34	31,144	510	467,160
852	35	29,820	525	447,300
820	36	29,520	540	442,800
788	37	29,156	555	437,340
756	38	28,728	570	430,920
724	39	28,236	585	423,540
692	40	27,680	600	415,200
660	41	27,060	615	405,900
628	42	26,376	630	395,640
596	44	26,224	660	393,360
564	45	25,380	675	380,700
532	46	24,472	690	367,080
500	48	24,000	720	360,000
468	49	22,932	735	343,980
436	51	22,236	765	333,540
404	53	21,412	795	321,180
372	55	20,460	825	306,900
340	57	19,380	855	290,700
308	59	18,172	885	272,580
276	62	17,112	930	256,680
244	65	15,860	975	237,900
212	68	14,416	1,020	216,240
180	71	12,780	1,065	191,700
148	74	10,952	1,110	164,280
116	78	9,048	1,170	135,720
84	83	6,972	1,245	104,580
52	88	4,576	1,320	68,640
20	93	1,860	1,395	27,900

Equal Length Physical Records With Keys

KL+DL Bytes (Max)	Track Capacity		Cylinder Capacity	
	Records	Bytes	Records	Bytes
47,240	1	47,240	15	708,600
23,240	2	46,480	30	697,200
15,240	3	45,720	45	685,800
11,240	4	44,960	60	674,400
8,840	5	44,200	75	663,000
7,240	6	43,440	90	651,600
6,120	7	42,840	105	642,600
5,256	8	42,048	120	630,720
4,584	9	41,256	135	618,840
4,040	10	40,400	150	606,000
3,624	11	39,864	165	597,960
3,240	12	38,880	180	583,200
2,952	13	38,376	195	575,640
2,696	14	37,744	210	566,160
2,440	15	36,600	225	549,000
2,248	16	35,968	240	539,520
2,088	17	35,496	255	532,440
1,928	18	34,704	270	520,560
1,768	19	33,592	285	503,880
1,640	20	32,800	300	492,000
1,544	21	32,424	315	486,360
1,448	22	31,856	330	477,840
1,352	23	31,096	345	466,440
1,256	24	30,144	360	452,160
1,160	25	29,000	375	435,000
1,096	26	28,496	390	427,440
1,032	27	27,864	405	417,960
968	28	27,104	420	406,560
904	29	26,216	435	393,240
840	30	25,200	450	378,000
808	31	25,048	465	375,720
744	32	23,808	480	357,120
712	33	23,496	495	352,440
680	34	23,120	510	346,800
616	35	21,560	525	323,400
584	36	21,024	540	315,360
552	37	20,424	555	306,360
520	38	19,760	570	296,400
488	39	19,032	585	285,480
456	40	18,240	600	273,600
424	41	17,384	615	260,760
392	42	16,464	630	246,960
360	44	15,840	660	237,600
328	45	14,760	675	221,400
296	46	13,616	690	204,240
264	48	12,672	720	190,080
232	49	11,368	735	170,520
200	51	10,200	765	153,000
168	53	8,904	795	133,560
136	55	7,480	825	112,200
104	57	5,928	855	88,920
72	59	4,248	885	63,720
40	62	2,480	930	37,200

Notes

First Edition (February 1983)

This reference summary is based on information in the *IBM 3380 Direct Access Storage Description and User's Guide,* Order No. GA26-1664.

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